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Forced displacements and the environment: Its place in national and international climate agenda

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ABSTRACT

Countries in the East African region have for decades been synonymous with natural disasters, conflicts and severe environmental degradation. About 10 million out of the 65.6 million displaced persons globally are found in this region. This paper presents an empirical analysis of environmental impacts caused by forced displacements in five East African countries. Contrary to a widely-held opinion, there is sufficient anecdotal and empirical evidence depicting environmental damage caused by refugees and/or Internally Displaced Persons (IDPs). A spatial analysis of current and former refugee and/or IDP camps in these five countries suggests the formation of "deforestation clusters" with concentrations of camps that compound environmental impacts. Technological advancements such as remote sensing capabilities can provide the means for assessing and implementing environmental protection measures. This paper recommends environmental care in humanitarian settings be considered an integral part of the Disaster Risk Reduction (DRR) and climate change/variability agenda, based on cost- and responsibility-sharing, employing technology, and incorporating appropriate monitoring tools.

1. Introduction

Globally, disasters have affected over 193 million people annually between 2005 and 2014 (World Disaster Report, 2015). Conflicts also force millions of people to flee their homes and settle as Internally Displaced Persons (IDPs) or refugees in temporary camps. The combined effect of natural disasters and conflicts on human displacements is astoundingly high. In 2014, the number of forced displacements jumped to an all-time high of 59.5 million (UNHCR, 2014). That figure increased to 65.3 million in 2015 and 65.6 in 2016, of which about 50 million are hosted in Asia and Africa (UNHCR, 2016, 2017). Even worse, it is estimated that by 2050, the world may have as many as 200 million environmental migrants due to climate change (Brown, 2008). If current trends are to go by, most refugees and IDPs (Displaced Persons – DPs) will be hosted by less-economically developed countries. At the end of 2016, the top six host countries were: Turkey (2.9 million), Pakistan (1.4 million), Lebanon (1.0 million), Islamic Republic of Iran (979,400), Uganda (940,800), and Ethiopia (791,600), in that order (UNHCR, 2017). The highest proportion (84%) of the displaced are hosted by low- and middle-income countries, 28% being in the least-developed countries. Other countries in the East Africa region, *inter alia* Kenya, Sudan, Rwanda, and Tanzania, also host a large number of DPs. According to 2016 Environmental Performance Indicators, these countries are ranked among the lowest (124–170 out of 180 countries) – evidence that they already have fragile environments. Climate change projections for Africa point to a worsening trend, particularly in the inland subtropics characterised by frequent occurrences of extreme heat, increasing aridity, and changes in rainfall (Serdeczny et al., 2016).

Studies have strongly affirmed that massive forced displacements and conflicts instigate significant environmental alterations including deforestation, soil degradation, water resources depletion, and environmental waste (Black, 1998; Kakonge, 2000; Biswas and Quiroz, 1996; Tafere et al., 2013; Fangama, 2015; Solomon et al., 2018). Refugees are expected to return home or resettle in a third country, while IDPs normally return to their original homes when the cause of their displacement has been addressed. However, DPs stay in temporary camps from few years to decades. Environmental damages and losses can, therefore, ensue at various stages of population migration. Rural refugees arriving in countries of first asylum either spontaneously settle in border areas or are channelled by host governments to assigned locations where they are registered, re-grouped, and relocated. Similarly, IDPs seek refuge in areas presumed safe from further harm, usually in an environment foreign to them. Such sudden movements tend to produce uncontrolled environmental damage resulting in serious disruptions of ecological systems (Simmance, 1987; Lonergan, 1995).

Despite decades of discourse and a series of policy frameworks since

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the Rio Earth Summit (UNCED, 1992), reviews of practicality (UNEP/OCHA, 2014) suggest that meaningful action to stop environmental damage in humanitarian response has been mediocre at best. The lack of adequate attention does not seem to emanate from a lack of human and financial resources in the humanitarian aid sector, as some like to believe. Since the establishment of the humanitarian system, subsequent to the adoption of UN General Assembly resolution 46/182 in 1991, the humanitarian support landscape has changed drastically. Humanitarian resources have grown exponentially, propelling the sector to a nearly US$ 27.3 billion annual budget in 2016 (Development Initiatives, 2017). The largest international NGOs are important economic and political actors with incomes amounting to more than half a billion USD annually, and a workforce of over 10,000 each (World Disaster Report, 2015).

Environmental policies related to humanitarian action are relatively recent because the humanitarian imperative took priority over environmental impacts that have been described by some as "globally insignificant" or the emphasis has been on environmental degradation that may have forced some people to become 'environmental refugees' rather than the environmental impacts created by the DPs themselves (Biswas and Quiroz, 1996; UNHCR, 2001). But, the second session of the UN Assembly of the United Nations Environmental Program "called upon member states to support and implement programs, projects, and development policies aimed at preventing or reducing the impact of armed conflicts on the natural environment … including the unintended collateral impacts of human displacement resulting from armed conflicts" (UNEP/EP.2/L.16.Rev.2, 2016). This recognises the seriousness of the challenge. What, then, is the reason for the lack of attention being paid by aid actors and local governments to such an important 21st century global concern as the environment?

2. Research objectives

For over three decades, East Africa has remained synonymous with natural disasters and conflicts, both generating and hosting the largest number of DPs in the continent. At the end of 2016, 5 out of the top 10 sources of refugees and 2 out of the 10 sources of IDPs were found in East Africa (UNHCR, 2016). Refugees have usually been settled in semi-arid, agriculturally marginal areas, or (as in the case of the Rwandese in Eastern DRC) near national parks or forest reserves (Shepherd, 1995). Arid & semi-arid locations such as *Darfur*, *Dadaab*, *Kakuma*, and *Dollo Ado* host some of the largest displacement camps on the continent. These refugee/IDP-camps tend to be large for both logistical and political reasons, and are believed to have a more negative impact on the environment compared to smaller ones (Shepherd, 1995). In addition, DPs are often forced to stay in these camps for decades. DRC refugees in Rwanda, South Sudanese in Uganda, and Somalis in Kenya are a few examples. In Darfur, over 2.5 million IDPs have been living in camps since the conflict started in 2003. A high number of people settled in extremely environmentally-sensitive areas for an indefinite period—often for decades—is a recipe for environmental disaster, especially when camps are not well designed, and without sound environmental management systems.

Several studies suggest that significant negative environmental changes are caused by sudden movements of large populations. During the 1994 Rwandan conflict, the *Virunga* National Park in Eastern DRC lost 300 km^2 of tropical rainforest (IISD & IUCN, 2002). In the first six months of the same year, tree resources within 5 km of the *Ngara* area of Tanzania had been all but depleted. A few months after the camp establishment, the average radius for fuelwood extended to 10 km or more from the camp's centre-point. These are rapid fuelwood depletion rates (Shepherd, 1995). Many of the displacement camps in the East African region have experienced a similar fate. In *Bokolomayo, Dollo Ado*, Ethiopia, more than 257 ha of woodland was totally cleared for refugee settlement, as well as 1182 ha for firewood, fencing and shelter in just a few months (Save the Environment Ethiopia, 2010). In *Lekadida*, another camp in the same area, more than 1722 ha was totally deforested to create space for the camp and satisfy the camp's need for timber. A recent study in Sudan demonstrated that in the Kuna *Zemberma* camp in *Gedarif* state— which is an arid ecological setting—15,685 refugees cleared more than 16,150 ha of forest for shelter and agriculture, as well as another 26,507 for building and renovation of the shelters— in a period of just twelve years (1985–1997) (Fangama, 2015). These figures don't include the amount of timber used to make furniture and charcoal for own use and for income generation. In Lebanon, environmental assessment on the impacts of Syrian refugees highlighted a rapid deterioration of the already-fragile state of the natural environment, due to the dramatic increase in the refugee population (MOE/EU/UNDP, 2014).

The intricate relationship between climate and displacement (though not all displacements are caused by climate change or variability) can be described as a vicious circle: climate change and variability affects the intensity and frequency of hydro-meteorological disasters and conflicts, which consequently sparks displacement; displacement affects the environment, and the environment in turn influences the climate. Environmental destruction caused by displaced persons is different from other forms of environmental degradations in that camps are often located in either already-degraded areas or are close to natural reserves (UNHCR, 2015). DPs are more destitute (at least until they settle) and confined to restricted spaces; lack local knowledge, have dysfunctional traditional/cultural leadership, and lack incentives to invest in environmental protection. In addition, logistical arrangements used to deliver goods and services are unique compared to that of host communities (Hoerz, 1995), and DP's basic needs are not always met by aid.

Lack of accountability is another key issue in relation to environmental care in humanitarian and development aid. Recent studies on the accountability of INGOs suggested poor stewardship towards the natural environment (Direct Impact Group, 2016). The study was based on factors such as environmental stewardship approaches, evidence in greenhouse emission reports, mitigative plans, the availability of monitoring systems in NGOs' plans, and any evidence of public awareness materials demonstrating environmental responsibility. The results say it all – only 5 out of 15 INGOs had environmental policies (about 33%). However, the implementation of those policies was based on individual initiatives, and even when implemented, they were less coordinated by a central function. When mentioned in NGOs' documents, environmental management is presented as a cross-cutting agenda not warranting relevance (Kelly, 2013). Perhaps the most frequently-mentioned reason is a "lack of systematic evidence on the unintended consequences of disaster responses," which must be critically investigated. Many analysts and practitioners in the field of Disaster Management expect the international community to take a clear and practical stand on the importance of caring for the environment, while at the same time providing humanitarian and development assistance to disaster victims.

This study endeavours to explore the implications of these factors in five East African countries (Ethiopia, Kenya, Rwanda, Sudan and Uganda) hosting a total of 6,873,533 persons sheltered in more than 57 refugee and IDP camps. The study attempts to:

i) find out, from literature review, how environmental protection issues have so far been addressed in refugee/IDP settlements, and whether or not the issues have been included in the climate change discussions;
ii) review current gaps in Environmental Assessment (EA) and Environmental Impact Assessment (EIA) policies and practices in the five host countries and Non-Governmental Organizations (NGOs) involved in addressing the needs of displaced persons;
iii) provide additional empirical evidence from the five countries that are currently hosting the highest number of DPs in East Africa using Rapid Environmental Assessment (REA), Focused Group Discussion

(FGD), and Delphi approaches;
iv) review literature on spatial analysis of displacement camps and, using geolocations of the major DPs camps and gather evidence of density of camps in the five countries;
v) draw relevant recommendations helpful to the planning, implementation and evaluation of environmental impact, and how these can be integrated into the Disaster-Risk Reduction and climate change agenda.

This study does not claim to cover all disaster-related environmental impacts, but rather focuses on those that are caused and/or exacerbated by DPs. It also reviews the countries' legislative grounds, their practicality, and the adequacy of systems and procedures to analyse environmental impact caused by forced displacements. Even though the definition of 'environmental impact' covers a much wider range of changes (ISO1401 definition[2]), the study is limited to the impact on forests, soil, water, and degradation of the overall physical environment. Likewise, "displacement camp" denotes a clearly recognisable shelter distinguished from what might be regarded as 'permanent settlements' or 'villages' by their size, density, dependence on external aid, and the level of control exercised over inhabitants by national or international authorities (Black, 1998).

This paper is not about condemning refugees for being 'environmental degraders,' nor does it aim to deny refugees their rights to their well-deserved basic needs. Rather, it attempts to find out whether or not DPs camps require due attention in light of environmental degradation in general and with respect to climate change/variability in particular.

3. Methodology

In this study, five approaches were employed: meta-analysis, Rapid Environmental Assessment (REA), focus group discussions, the Delphi approach, and spatial analysis.

3.1. Meta-analysis

Literature review using online browsing was used to gather environmental practices during design and management of displacement camps. Google & Google Scholar were the search engines used to access the relevant documents. Some documents such as policies, proclamations, and program reports that were not available online were directly requested from government line ministries, NGOs and UN agencies. To ensure quality and consistency, publications accessed directly from academic institutions, research publishers, and books were accepted without further scrutiny, while documents from governments, NGOs and UN agencies came directly from the entities' own websites or studies sponsored by these entities. The search did have not have restrictions based on the year of publication. Further, a narrative review (Berrang-Ford, Pearce and Ford, 2015) was used to select documents for relevance and analysis of content in the following areas:

Country Policy: country policies or legislations on overall environmental strategy and environmental impact assessment were reviewed. "Environmental policy" and "environmental impact assessment (EIA) policy/procedure/proclamation" were the terms used using the search engines. Once the documents were accessed, all of the sections were reviewed to see if issues with displacement had been mentioned in the documents; when references to displacements, or IDPs and or refugees were found, the narrative review was conducted on the provisions for implementation and monitoring.

Programs: inclusion of, quality, and consistency of environmental protection in programs related to DPs involved review of UN and NGO program documents for displaced persons for the previous 5 years. Documents that had at least a chapter (or section) on environmental protection programs and/or activity budgets made it on the list. Other information such as the consistency (or lack of it) of environmental protection interventions was gathered from expert group discussions.

DPs camps and climate change: National climate change action plans of the five countries until the year 2016 were reviewed. Using Google & Google Scholar, "climate change impacts of displacement camps or IDP and/or refugee camps" and "climate change and conflict" were searched for hard copies or scanned copies of documents obtained from the five countries. The searches were made manually. Mention of these "items" in the policy documents was necessary to identify any causality or relationship between climate change and displacements.

3.2. Rapid Environmental Assessment (REA)

REA, a common tool for post-disaster programs, was one of the tools used. Standard FRAME Toolkit module III REA forms (UNHCR & Care, 2005) were emailed to 15 NGO and government experts in the five countries, and were followed up by telephone conversations to verify the results. The NGO experts were selected from those with the largest programs in displacement camps in each country, while the government experts were assigned by their offices for their relevant knowledge. To avoid bias, their responses were supported by assessments carried out by their respective agencies and community opinions. Follow up emails were sent until responses were received from each agency. The results were then summarised to generate the top five major issues. The top five environmental risks identified based on the level of impact and degree of urgency of the risks were later presented to another ten headquarter-based NGO practitioners in these countries. This was an attempt to understand relationships between organizational policies and field practices. The results of the two-tier analyses were compiled to identify the top five environmental risks.

3.3. Focus group discussion (FGD)

Focus group discussions were held with two groups from each country (one expert group and another host community group). Those included in the expert groups were selected due to their involvement in program design and implementation for the DPs and in camp coordination committees. The camp coordination system is made up of experts from government, UN agencies and NGOs. Program implementers and camp coordinators with more than three years of experience in the same camp or similar camps were selected from the active agencies in the largest DPs camps of each country. On the other hand, community representatives were randomly selected from among the displaced, but included a mix of women and men, traditional leaders, and leaders of various groups in the camps. Each FGD involved between seven and twelve persons to ensure diversity of options. The groups were asked to identify the top five environmental damages and provide examples that justified their narratives. The discussions were held over a period of five years in order to understand the gravity of the situation, and to gauge the level of awareness among the experts and the community.

3.4. Delphi approach

The Delphi approach was used to determine priorities among the major environmental threats that were identified by the literature review, the REA analysis, and group discussions. From among the expert groups, five local government and NGO experts were identified to represent field practitioners, policy makers and government regulators. Those from NGOs were heads of programming based at their regional offices (Nairobi) while those from government were experts working for the environment offices. Emails containing the list of the top five previously identified environmental damages were sent to these experts for

[2] "Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects".

prioritisation based on their magnitude and severity. The process was repeated until consensus was reached by all experts.

3.5. Spatial analysis

As part of the meta-analysis, Google & Google Scholar searches were made on "spatial analysis of IDP and/or refugee camps." Studies conducted on areas that coincide with the geographic locations of the displacement camps and the time these areas were occupied by IDPs were analysed. The spatial analysis on deforestation was mainly based on the few references obtained from the search process, but the materials did not cover all of the countries under review. For the remaining areas, geolocations of the displacement camps (using GPS coordinates) were superimposed on Google Maps and were compared with deforestation reports recorded in existing studies and host community accounts. Using the rate of deforestation reports and results from the FGD, camps located within a range of 50–100 km air distance formed potential deforestation clusters through ripple effects.

The study was conducted between June 2015 and December 2016. It covered two major refugee camps in each of the four countries (Ethiopia, Kenya, Rwanda and Uganda) and three IDP camps in Sudan. Results of previous studies from other countries such as Tanzania and South Sudan that also hosted a significant number of DPs were referred to.

The presentation of the findings is organised as follows: findings from meta-analysis are presented first (on policy analysis, environment and humanitarian programming, and climate change and displacement) followed by narratives from REA, group discussions, and Delphi analyses. The findings from the REA analysis have been complemented by results from group discussions and vice versa. Common findings from all five countries have been merged together to draw the conclusions and recommendations.

4. Findings

4.1. Results of the meta-analysis

4.1.1. Environmental policy and practice

The policy review focused on the five countries' environmental policies and legislative regimes regarding their respective environmental strategy, and Environmental Impact Assessment (EIA) procedures (if any). In this regard, the reviews showed some commonalities and a few peculiarities. What is common is that environmental policies and legislative regimes in the five countries are scattered in a multiplicity of sector-specific laws and policy papers, and the institutions and departments that deal with environmental issues are equally numerous. Neither detailed procedures nor resources adequate for implementing environmental assessments and auditing have thus far been demonstrated. Environmental issues are mentioned in sector documents, but implementation has been relegated to discretionary decisions and the availability of donor funding. Practitioners lack experience in applied tools and procedures; reports are not available to the public; environmental concerns and knowledge among the public and government employees is very weak; baseline data are not available, and most of the data are out of date.

Perhaps another important policy gap uniformly observed in these countries is the lack of proper monitoring and auditing guidelines and enforcement mechanisms. Little to no human and financial capacity is available in all countries to implement what the laws of these countries have already legislated. Nonetheless, the five countries have ratified the major environmental conventions, and four out of the five have promulgated EIA policies and implementation procedures. However, none have mentioned forced displacement as a potential environmental concern; nor have they seriously implemented EIA or a revised version of it while selecting DPs camps.

Ethiopian environmental policy draws its legitimacy and principles from the 1995 constitution. The Environmental Protection Act, promulgated in 1997, laid the ground work for subsequent policies and procedures including the EIA, enacted in 2002, which outlined further details. Although the EIA policy and its corresponding procedures seem relatively comprehensive, they completely overlook issues related to forced displacement and voluntary resettlement programs. Almost every line ministry mentions mainstreaming environmental issues in its strategies and policy documents. However, the EIA is given the least priority in matters related to DPs. Even when environmental assessments were carried out, there was no strong evidence showing the implementation of mitigative measures. Currently, Ethiopia hosts the second-largest refugee population in Africa in its 26 camps spread all over the country, the majority being in arid or semi-arid environments. This does not seem to be cohesive with the country's green economic development strategy (FDRE, 2011) and its voluntary resettlement programs aimed at reducing pressure from the densely-populated highlands. While some progress has been noted in carrying out EIAs for donor-funded mega-projects, the Environmental Protection Agency is not equipped with the tools and resources to regularly monitor the impact of settlement camps and the implementation of recommendations.

Kenya implemented national environmental governance structures with the establishment of the Environmental Management and Coordination Act (EMCA) in 1999 (Okidi et al., 2008), followed by the environmental assessment and audit policy in 2003. The EMCA laid the foundation for the Kenyan National Environment Policy (NEP) which was crafted in 2013. This policy recognises major environmental and natural resource damage caused by the huge increase in the number of refugees and recommends mainstreaming environmental considerations in refugee policies and legislations (Ministry of Environment, Water and Natural Resources, 2013). Kenya hosts the third-largest number of refugees in Africa, following Uganda and Ethiopia (Table 1).

Table 1
Summary of DPs in selected countries in East Africa.
Source: UNHCR Population & Operational Update, January 2018

No	Country	No. of Displaced persons		Total No of displaced Persons	No of major Camps	History & location of refugee and/or IDP camps
		Refugees	IDPs			
1	Ethiopia	893,938	857,000[a]	1,750,938	> 30	Hosted refugees since the 1990s; some camps in dense forest areas
2	Kenya	486,460	–	486,460	2	Hosted refugees since early 1990s; camps located in arid areas
3	Rwanda	173,419	–	173,419	6	Hosted refuges Intermittently since 19960s; camps near forests & farms
4	Sudan	767,570	2,300,000	3,067,570	10	Hosted refugees from the 1984 to early 1990s; and IDPs since 2003
5	Uganda	1,395,146	–	1,395,146	9	Hosted refugees in 1960s & 1990s, but IDPs in the 1980s
	Total	**3,716,533**	**3,157,000**	**6,873,533**[b]	**> 57**	

[a] Ethiopia: Conflict Displacement, OCHA Situation Report, 23 January 2018.
[b] The total figure may seem exaggerated by very high number of refugees from S. Sudan and recent IDP figures from Ethiopia. However, UNHCR refugee & IDP statistics shows an average of 4–5 million annually.

Dadaab, the largest refugee camp in Africa with five satellite camps, is found in this country (Rawlence, 2016). Since its establishment in 1991, many studies have revealed the scale of damages in this and other camps. However, Kenyan environmental policy and practice do not demonstrate commensurate levels of attention towards protecting against further damages. No serious EIA has thus far been carried out by the government, and where evidence was available, no remedial measures were executed.

The guiding framework for an EIA in Rwanda hangs on Article 67 of the official Gazette of the Republic of Rwanda No 04/2005 (endorsed by the country's parliament in April 2005), and aims at protecting, conserving, and promoting the environment (Republic of Rwanda, 2005). Even though it states that "every project shall be subject to an EIA before it is implemented," issues related to settlement areas for DPs are not mentioned in the directives. The Rwanda Environment Management Authority (REMA) is legally responsible for approving EIA studies, but the actual implementation of laws, policies, strategies, objectives and programs relating to protection, conservation and promotion of the environment are decentralized among various entities. Although major projects that require donor funding are implemented per the required EIA law, further follow-up and audit is largely neglected. The national policy stipulates funding as one of the most limiting factors hindering proper implementation of environmental policies. Experts in the field also cite technical capacity and lack of political will as other bottlenecks.

Sudan's history of hosting a record number of refugees goes back to the 1980s, but the country became home to the largest number of IDPs in Africa in 2003 (about 3 million). A form of EIA was applied to projects such as the Equatorial Nile Project (ENP) in 1954, but detailed tools and procedures have not been legislated until 2001 (Ahmed, and Elturabi, 2011). However, despite ample evidence of detrimental environmental destruction exacerbated by DPs, new settlement sites continue to be selected randomly and without due regard for the environment (Fangama, 2015). To-date, only international donors funding major projects demand and usually supervise the implementation of the standard EIA or a variation of it. UNEP investigated about 650 country projects, of which only 4 were found to have attempted mainstreaming environmental issues (UNEP, 2014). Most of the EIA practices failed in major areas such as: the timing of the EIA in the project cycle, the diversity of tools applied (which, in most cases, was insufficient for specific projects), public participation, engagement with decision-makers, implementation of recommendations, and monitoring progress.

In Uganda, the process of EIAs was not a legal requirement before the enactment of the National Environment Statute (NES) in 1995, which was followed by the 1998 EIA act. The National Environment Management Authority (NEMA), was created in 1996 as the principal agency responsible for oversight, co-ordination, and monitoring of compliance with EIA requirements (NEMA, 2005). Most districts in the country have environmental offices and committees charged with handling environmental matters in their jurisdictions. Government and civil society organizations also promote environmental committees in institutions such as schools. Unlike other countries, Uganda has enacted a national IDP policy in line with the Pact on Security, Stability and Development in the Great Lakes Region, that obliges its member states to protect and support IDPs and respect their property rights (Santner, 2013). This policy was promulgated to smoothly reintegrate about 1.8 million IDPs affected since the war with the Lord's Resistance Army (LRA) that started in 1987. Uganda is perhaps the most effective country in the region to have implemented EIA for development projects; over 950 projects have been subjected to EIA in the first ten years of the enactment of the laws (Ecaat, 2004). Despite various statutes and faculties authorised to implement the provisions, however, humanitarian projects hosting DPs remained exceptions to the rule. As a host of historical refugees for decades and current home to the largest number of refugees in the continent (Table 1), and with the proximity of its rainforests to the DPs bases, Uganda requires better environmental protection practices.

4.1.2. Climate – displacement relationships

Since the release of the fourth assessment report of the International Panel on Climate Change in 2007 (IPCC, 2007), anthropogenic impact on climate change was widely recognised and adaptation to climate change emerged as a necessary field of engagement, especially for developing countries. The Google & Google Scholar searches on the subject show that many studies have since looked at the relationships between climate change and disasters. Most of the literature talks about how greenhouse gases generated from deforestation and various forms of industrial emissions affect the climate, and in return how climate change has increased disaster incidents globally.

Publications that relate the physical environment to environmental security were divers in content and presentation. Some studies suggested that, in East and Sub-Saharan Africa, warmer-than-normal temperatures raise the risk of violence, whereas average and cooler temperatures have no/less effect (Hendrix and Glaser, 2007; O'Loughlina et al., 2012). Almost all publications focused more on how environmental degradation threatens human security by increasing displacements (for example: Sascha-Dominik and Sanden, 2013). Some publications made indirect references (through the impact on the environment) to the connection between violent conflict and environmental degradation Conca and Wallace (2009); and the depletion of renewable natural resources and human security (Barnett and Adger, 2007). However, the links between climate change and human mobility are not always grounded in evidence (ODI and UNDP, 2017). For example, a recent study found that climate variations did not significantly impact the level of regional conflict or the total number of DPs, but variations in refugee numbers were found to be significantly related to climatic variations as well as political stability, population and economic growth (Owain and Maslin, 2018).

The climate change policies of the five countries are presented under different titles. Three countries (Ethiopia, Rwanda and Sudan) have National Adaptation Programs of Action (NAPA) in place, while the two (Kenya and Uganda) outlined their climate change strategies under National Climate Change Action Plans (NCCAPs). Review of these documents shows no evidence of displacements being mentioned as challenges, nor have solutions been recommended to address issues experienced by displacement camps.

4.2. Findings from REA, meta-analysis, and group discussions

The top five key factors identified by REA as having the highest levels of impact and urgency are: *deforestation* (for shelter construction, household furniture, and agricultural purposes), *energy consumption* (firewood and charcoal), *encroachment on protected areas*, *water resource depletion*, and overall *soil erosion* both in the camps and nearby areas. In addition, other factors such as loss of biodiversity (due to deforestation, land occupation for settlement and agriculture, illegal hunting); and water pollution (waste water, solid waste disposal, and river silting due to erosion) have also been mentioned in one or more countries. The magnitude of the problems is severe and requires urgent action.

a) Ethiopia

Land degradation is a common environmental problem in Ethiopia (Gashaw et al., 2014). Nonetheless, it continues to host large numbers of refugees since early 1990s, spread throughout more than 26 camps in almost all regional states (Table 1). 67% of the camps are located in the arid regions of the regional states of the Afar and Somali, while 16% are in the semi-arid areas of Tigray. Still others are in the western rainforest areas of *Gambella* and *Benshangul* regional states.

An earlier study carried out in the *Dollo Ado* camps hosting Somali refugees, using a similar impact assessment methodology, found out

that the camp and surrounding areas are characterised by degraded woodland under intense and continued runoff and wind erosion. In one of the sub-camps in the Somali region (*Bokolmayo,* which was then hosting about 40,000 refugees), more than 1439 ha of land was cleared for camp construction and firewood (Save the Environment Ethiopia, 2010). Residents in the refugee camps complained about sand storms due to lack of wind breaks. In addition to livestock owned by the host communities, refugees also arrive with their own, increasing the pressure on water and pasture. Elders indicated that wildlife that were very common in the area have now disappeared due to hunting.

Experts and members of the host community almost unanimously attested that environmental issues were of the least concern, especially when the first refugees arrived. Sites were selected primarily for safety reasons and camps were put up with haste. Environmental considerations surfaced long after the camp sites had been established and refugees hosted, often when authorities were faced with complaints from host communities, or when the need arises to expand the camps to host additional caseloads. Without prior zoning of areas based on their ecological sensitivity, and without political will to protect the environment, forced displacement remains of great concern. On May 4th, 2017, Ethiopia's national television network (EBC) broadcasted a program on complaints made by host communities and authorities accusing Sudanese refugees in the *Benshangul* regional state of illegal logging and hunting in a nearby protected forest. Authorities attributed the challenge to a lack of procedures dealing with refugee affairs. The respondents, when asked if they thought the situation would improve in the foreseeable future, unanimously expressed pessimism.

The number and geographic spread of the refugee camps (26 camps in almost all regional states) is a clear indication that the refugees come from almost all neighbouring countries. The country being surrounded by unstable and conflict-ridden neighbours such as Somalia, South Sudan and Sudan, it is likely to continue being overwhelmed by an influx of refugees.

b) Kenya

Hosting refugees has been part of Kenya's history since the 1990s. *Dadaab* (Fig. 1) and *Kakuma* are among the oldest and largest refugee homes established in semi-arid environments, which are not suited for rapid exploitation due to slow vegetation growth and groundwater recharge rates. Many researchers observed irreversible land degradation and loss of biodiversity in these camps as early as the 1990s (Helin, 1990). Before the settlement of the refugees in *Dadaab*, the natural vegetation was relatively dense, comprised of trees, shrubs and grasses that sustained the pastoral economy (Yasin, 2011). Just a few years after its establishment in 1994, it was reported that firewood availability had moved further away, now 10 km from the camp, while timber for construction was 40 km away (Delmas and Courvallet, 1994). The arid nature of the environment is the reason for the rapid depletion of forest resources. Signs of water depletion and increased salinity have also been reported as early as the 1990s (Perrochet et al., 2016). This occurred at a time when the catchment area was being cleared.

Currently, Kenya hosts the third-largest number of refugees in Africa, located in two camps. The areas around the camps are home to local pastoralists, which limits their movement and thereby forces them to be concentrated in a smaller area. Livelihoods, activities and livestock movements of host communities, thus remain constrained, which in turn results in overexploitation. Furthermore, when refugees are granted access to specific natural resources due to their refugee status, local inhabitants follow suit. This creates unwanted but subtly executed competition in harvesting trees and other natural resources, thereby exacerbating the process.

The findings of this study concur with previous studies clearly indicating significant reduction in vegetation cover and water depletion, further restricting the capacity of the resources to sustainably support current and future community needs. A study carried out in 2010 to determine the extent of logging estimated that tree density reduction of 67% was observed within a 10 km radius of the camps, compared to that of 40 km away, as well as a 19% volume reduction as far as 20 km away from the camp (Enghoff et al., 2010). Consequently, the extent of environmental damage is not limited to the camp surroundings – it has a far greater reach. The impacts can be characterised as direct (consumption by refugees themselves) and indirect through host communities (compounding and competing effects). Tree-cutting is not necessarily performed by the refugees alone, but also by host communities themselves in response to the new markets created for firewood and charcoal.

c) Rwanda

The six refugee camps in Rwanda, currently home to more than 156,065 refugees, are spread over a large geographic area where environmental integrity is already in decline due to population pressure and the impact of climate (see Fig. 1). The country hosted refugees intermittently since the 1960s, and IDPs in early 1990s. Rwanda being one of the most densely-populated in sub-Saharan Africa, with 457 persons per km^2 (Rwanda Population, 2017), its environment is already under constant pressure from local residents. The topography is characterised by a multiplicity of steep slopes, densely-cultivated landscapes, and a highly-modified, anthropogenic ecosystem. Forest products are limited, water is locally very variable, and pastures are not readily available; additional pressures from refugees accelerate the degradation. The study revealed that areas close to refugee camps experienced rapid deterioration of deforestation due mainly to shelter construction, consumption of firewood and building materials (Fig. 2); loss of biodiversity due to increased loss of soil cover by human movements and

Fig. 1. Partial view of Dadaab refugee camp, Kenya.

Fig. 2. Partial view of forest products piled up for sale near the Maham refugee camp.

demand for pasture; and sewage pollution emanating from unmanaged wastewater drainage from congested shelters.

The expert groups hinted that introducing appropriate technologies to manage refugee affairs has the potential to reduce resource over-exploitation, thereby fostering peaceful coexistence with the hosts. Refugees in the *Gihembe* camp in the north-western part of the country—which introduced mobile money transfers— reported a "reduced need for illegal firewood collection due to purchasing preferred food items that require less cooking time, has addressed one of the key sources of conflict with the local community, namely the scramble over natural resources" (Tafere et al., 2014). However, only a few camps have introduced the technology, limiting its potential benefits. Rwanda shares borders with the DRC and Burundi, which have both remained unstable for decades and are the sources of spikes in refugee influxes. In 2015, when political unrest reigned in Burundi, more than 50,000 refugees crossed to Rwanda in just two months, which necessitated the establishment of new temporary and permanent camps. Countries located in epicentres of conflict and natural disasters call for robust environmental policy and practice to maintain control of their environments and conserve them for future generations.

d) Sudan

Sudan already suffers from severe environmental degradation, the most important impacts being reduced agricultural productivity and substantial socio-economic costs (University of Gothenburg, 2011). It is this environment that hosts refugees since 1984, and since 2003, the highest number of IDPs in the continent and hence, findings from the study are more alarming compared to the other four countries. Currently there are close to three million forcibly displaced persons concentrated in seven main IDP, and three refugee camps. Deforestation and scarcity of water were ranked as the top environmental impacts in these camps. Although various views are entertained on the source of the 2003 Darfur crisis, some analysts strongly suggest that environmental factors were at the heart of the conflict (Gebresenbet, 2009). Climate change-driven steady declines in rainfall that started in the 1920s have greatly accelerated the process of environmental degradation and undermined subsistence livelihoods in the area in recent decades (Bromwich, 2008).

The IDP camps are located in parts of the Sahel, which is a semi-arid grassland and shrub-land region bordering the Sahara Desert. The areas receive just enough rainfall to farm, but as a transition zone between the arid Sahara in the north and the sub-humid tropical savannas in the south, and marked by a steep north–south gradient of mean annual rainfall, the region falls under extreme fragility. Because of the hot whether conditions, shelters are normally built using tree and bush branches, but require frequent repair because of strong winds. However, reports have indicated acute deforestation that led to the destruction of livelihoods because of brick production for humanitarian operations in Darfur (UNEP/OCHA, 2014). Between 2003 and 2005 alone, international agencies were the main consumers of construction timber as they set up the infrastructure for IDP camps. It is estimated that 1.5 million kg of firewood is needed daily to provide fuel for the more than 2 million IDPs; and within a few years, IDPs in *Kalma* camp had to trek more than 15 km, and sometimes even more than 50 km, to find wood (IUCN, 2009).

e) Uganda

Uganda's geo-political location (the Great Lakes region) has made it a centre for refugees originating from Burundi, Rwanda, the DRC, and South Sudan. It also generated its own share of refugees in the 1970s, as well as IDPs in the ensuing decades, due to internal conflicts. By the 1980s, it was estimated that 7% of its population had become displaced (Zachary et al., 2001). The conflict in the DRC (formerly Zaire) in the 1960s, the Rwandan genocide in the 1990s, and the ongoing war in South Sudan caused the influxes. At the end of 2015, Uganda hosted 477,187 DPs. Following recent flares of conflicts in South Sudan, the figures jumped to 940,835 at the end of 2016 (UNHCR, 2017). Uganda is also prone to natural disasters, with 61 disasters reported between 1980 and 2010 alone (IDMC, 2014). The areas that experience these disasters are also those hosting displaced persons.

Findings from earlier studies on another refugee camp in the southwestern part of the country, *Rwamwanja*, also implied alarming environmental damages (IUCN & UNEP, 2012). *Rwamwanja* was a refugee camp in the 1960s, but was closed in 1995 when the Rwandese refugees returned home. The refugee camp is approximately 108 km^2 bordering a 211 Km^2 *Katango* game reserve close to the *Katonga* river. The UNHCR and the Ugandan government decided to reopen it in April 2012 to host new refugee arrivals from the DRC. However, host communities vehemently opposed the idea to the extent that the government had to use military force to subdue the opposition. The host communities were obligated to raise their collective voices because a former savannah grassland that was a means of livelihood for these semi-pastoralist communities had been seriously degraded by the refugees that occupied the area up until the 1990s.

According to group discussions and field practitioners, water wells were sunk for refugee camps without proper hydro-geological and environmental consideration, because availing adequate water as urgently as possible had been the primary occupation of the UNHCR and the government. Environmental considerations appeared important to these officials much later in the process. Consequently, wells are concentrated within the vicinity of the camps. In one refugee camp, there are 38 functional wells. Over-extraction of aquifers, and human and livestock concentration around water points, could have been avoided with proper planning. Intermittent and at times continuous conflicts and natural disasters make the whole Northern Ugandan environment vulnerable to a more protracted climate-conflict cycle.

Expert groups in the five countries identified major bottlenecks thwarting environmental care in their respective countries. At the top of the list are (in that order): i) policymakers' bias to urgent humanitarian needs compared to strict abidance by regulations, and as a result lack of political will; ii) lack of clear procedures that translate the policy directions into practice for aid projects; iii) lack of financial and technical capacity; iv) the scattered nature of the responsibilities across various line ministries, and the ad-hoc nature of the coordination mechanisms; and v) lack of awareness even among experts working in environmental agencies. These findings are in congruence with earlier findings (Gubena, 2016). The study concludes that knowledge of the appropriate EIA (or a modified version of it) remains at a theoretical level, its practical application being at the bottom of the priority list. A lot needs to be done to create a momentum of urgency. This is not unique to DPs affaires, but is common even with major government projects which, per international conventions, require a full-scale EIA.

The experts from the five countries also recognised the gravity of environmental damages caused by sudden and unplanned human settlements and complain about carrying the burden alone, which according to them, can sooner or later lead to refusing to accept refugees. Tanzania, Turkey and Honduras at some point refused to host refugees due to potential environmental risks (Black, 1998). In 2015, Kenya threatened to close *Dadaab* camp, complaining of insecurity. European countries also complain of the exodus of refugees originating from Africa, including the countries involved in this study. The discomfort of host communities and governments will likely intensify as the situation escalates due to compounded effects of poverty and climate change/variation.

Despite the gruesome pictures painted by the above data, small-scale mitigative projects have been implemented in the five countries. The UNHCR as well as local administration and international partners have encouraged programs in some refugee camps to integrate conservation activities and fuel-efficient stoves. Awareness-creation campaigns were provided to both the refugees and host communities aimed

Table 2
Top five causes obtained from Delphi iterations.

No	Priority	Level of impact by duration of settlement			Comments
		0–3 years	3–7 years	Above 7 years	
1	Shelter construction	Most degrading	Maintenance	Renovation/replacement	Camp population is key factor
2	Energy source	High	High	Medium to high depending on the introduction of technology	Dependent on types of food, quantity, and awareness levels
3	livelihoods	Low	High	High	Degree of provision of basic needs determines
4	Water depletion	High	High	High	Influenced by climate, population and livestock density
5	Animal feed	Low	Medium	High	Dependent on number of pastoralist community, and market

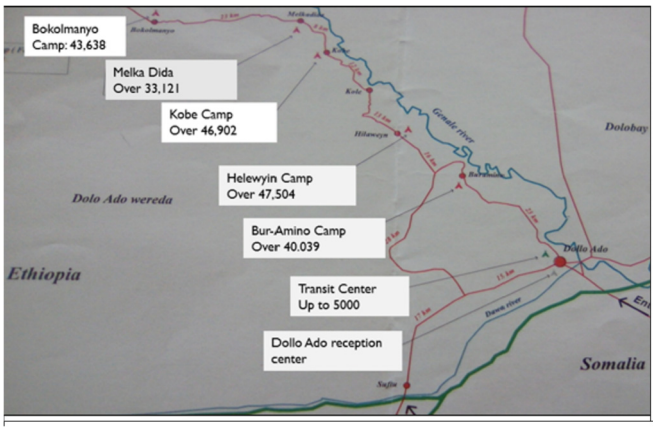

Fig. 3. An "impact cluster" of five camps in Dollo area, near the Ethiopia-Kenya- Somalia boarder with a total of 211, 204 refugees from Somalia (May 2017).

at peaceful co-inhabitation and natural resource conservation. However, such efforts were small-scale, uncoordinated, and project-based. Isolated cases need to grow to encompass all camps, and they need to be supported by a political will to enact policies, avail adequate financing, and design functional monitoring tools.

4.2.1. Delphi analysis

The results from the Delphi process identified camp and shelter construction as a major cause of deforestation, followed by energy consumption. In just two iterations, consensus was reached on the top five causes of environmental impacts. Experts qualified their rankings by stating some conditions (Table 2).

4.3. Spatial analysis

A few studies conducted prior to this research investigated the spatial distributions of the displacement camps in East Africa. The majority focused on the vast Darfur region, where IDPs are scattered throughout the Darfur region (South Darfur, North, and West Darfur regions). Transversal assessment using satellite imagery over three-time slices (2002, 2004, 2008) has indicated deteriorating forest and soil conditions with an increasing number of IDPs in and around a large IDP camp in northern Darfur (Hagenlocher et al., 2012). Another study that compared 2003–2008 high-resolution satellite images (Spot 4 and IKONOS and QuickBird satellites imagery), the rate of local population growth, and the high concentration of human population in the Zalingei IDP camps, discovered higher vegetation decrease surrounding the IDP camp (Spröhnle et al., 2015).

Another study made on the "wood-shade" zone (wood supply area for the IDPs) in the Darfur region, discovered an overlap between recently deforested areas and wood supply sources for IDPs (WISDOM Darfur, 2010) forming a "*deforestation cluster.*" Assuming conservative estimates, the sustainable wood supply zone covers almost 300,000 km^2, covering the entire central Darfur region. The impact of individual camps may be undermined for reasons of being small-scale. But spill-overs from adjacent impact areas can form a bigger cluster zone, thereby expanding the geographic coverage of the impact areas.

Another study that used satellite information to evaluate the impact of a long-inhabited (over 22 years) IDP in Pader district, Northern Uganda, showed similar results (Owona, 2008). A district-wide comparison of vegetative cover around the IDP camps from 1986 to 2008 shows that 13,886 km^2 of land have been deforested, an increase from 3469 km^2 in 1986 to 173,553 km^2 in 2008. Throughout the war in northern Uganda (since late 1980s), there were 157 IDP camps that significantly degraded the environment through deforestation, soil erosion, habitat destruction and pollution.

The results of the geospatial analysis using GPS locations of major DPs camps suggest similar clustering. The northern, north-eastern, and southwestern parts of Uganda contain important deforestation clusters in the region due to prolonged exposure to unceasing conflicts and forced displacement. Refugee camps in western Tigray (hosting Eritrean refugees), western Ethiopia (Gambella and *Benshangul* regions), southern Ethiopia (Somali region and *Borena* in Ethiopia and Kenya), western Rwanda, and central Darfur form the other clusters.

In the Somali regional state of Ethiopia, many camps are located within a short distance from each other (20–100 Km apart) whose radius of influence can merge to form a "*deforestation cluster*" over many years. In the *Dollo Ado* area for example, five camps have been established along the *Genale* river, in close proximity to each other (Fig. 3).

In northern Uganda, the camps have impacts that ripple beyond the borders of Uganda far into Kenya and South Sudan, forming another *deforestation cluster* attributed to forced displacements (Fig. 4). Most of the refugees entering Uganda from South Sudan are based in the north-western area. This is the same region that hosted about 1.8 million IDPs at the peak of the 2005 conflict between the Lord's Resistance Army (LRA) and the Ugandan Defence Force (IDMC, 2014).

The IDPs were settled in 148 camps spread throughout this northern region. They returned to their peaceful lives after the warring parties signed a ceasefire agreement in 2006. However, inter-communal violence continued to spark instability that created temporary displacements. When the south Sudanese conflict erupted in December 2013, refugees flocked to this region in the thousands.

On the north-eastern corner is *Karamoja*, another environmentally - sensitive pastoralist region characterised by conflict due to cattle-rustling, but also home to IDP camps. This environment has been severely degraded by years of conflict, climate change, and unprotected access by DPs (Mubiru, 2010). Degradation of this savannah rangeland threatens to destroy its inhabitants and their livelihoods.

In countries that host DPs, camps are located not too far away from each other. The impact of an individual camp (especially the smaller ones) or country may be considered insignificant on a global scale. However, in an already-degraded region where natural disasters and conflicts continue uninterrupted for decades, and droughts recur frequently due to climate change/variability, the combined impacts can create larger endangered zones.

Fig. 4. More than 528,000 refugees reside in five adjacent districts (Adjumani, Arua, Koboko, Moyo and Yumbe) forming an "impact cluster".

4.3.1. Other findings common to most of the countries include

Environments where displaced persons experience unique challenges compared to areas occupied by only local communities: 1) the majority of the 65 million displaced persons are situated in climate change hot-spots (UNHCR, 2015); 2) many of the camp sites have served intermittently for many decades exposing them to unmanaged resource utilization; 3) the initial arrival phase of refugee influxes may be accompanied by severe environmental impacts when DPs move into and through an area to secure their immediate needs (without prior planning and environmental assessment); 4) DPs put pressure on scarce resources; 5) grey areas in legal grounds between refugee protection and local laws encourage deforestation; 6) host communities use management loop holes to intensify deforestation (sense of competition); 7) camps are operated for decades (for example: Dadaab in Kenya, Karamojo in Uganda and Darfur); 8) in camp settings, the better-off and more visible hosts usually gain from the presence of DPs and from DPs programs, while the poorer among the hosts can be hidden losers – exposing them as indirect degraders. In addition, basic needs of DPs are almost never met fully and this leaves the victims no other option but to overexploited natural resources (Development Initiative, 2017). A previous study conducted in Tanzania also showed that refugees use 65% more resources than locals (Whitaker, 2002).

The major reasons for environmental degradation as identified by the expert groups are: the concentration of refugees served in each camp; length of stay of DPs (temporal); lack or shortage of supplies of basic needs; a growing number of youth without means of livelihood; lack of alternative technologies that replace energy and construction materials; the limited knowledge of refugees on environmental conservation and local norms; and the nature of the local climate (cold nights in some areas).

Humanitarian agencies, due to the humanitarian imperative, primarily focus on the delivery of humanitarian goods and services. Like the general lack of attention to environmental assessment in the context of climate change adaptation (Enriquez-de-Salamanca et al., 2017), the major global players in DPs affairs have the tendency to silently ignore the long-term environmental impacts (ECHO, 1995).

The impact of DPs on the local population and environment can also be indirect. Host communities often allow the actions of DPs as a reason to encroach on protected areas or violate local norms set to protect natural resources. In addition, the concentration of service centres in camps (markets, health facilities, water points) puts laser-focus on environmental degradation in and around these facilities.

The Sphere Standard has components of environmental care scattered under various sectors (WASH, Food Security & Nutrition, and shelter). It also recommends REAs as overall environmental assessment tools. However, environmental practitioners, donors and local governments do not demand adherence to these set standards. This makes it nominal, with little to no practical impact.

In general, the results reinforce findings stated elsewhere:

"Destruction of livelihoods and deforestation as a result of brick production for humanitarian operations in Darfur; dried up wells due to over-drilling for water by humanitarian organizations in Afghanistan; ruined livelihoods from an over-provision of fishing boats and consequent fishing stock depletion in post-Tsunami Sri Lanka; failure to meet waste treatment standards leading to environmental contamination in Haiti and the largest outbreak of cholera in recent history" (UNEP/OCHA, 2014).

The relevant literature and the results of this study seem to suggest that there is already adequate information on environmental impacts caused by armed conflicts and DPs. The evidence is, at least, indicative of the need to trigger pragmatic actions at the earliest possible time so that remedial measures may be taken to save livelihoods and the environment.

5. Recommendations

Despite a history of rich biodiversity, East Africa's environment is being degraded at an alarming rate and will continue in the same trajectory as long as the region remains synonymous with recurring conflicts and massive displacements. While encouraging calls for environmental protection have gathered momentum on other fronts, international aid appears to be too sluggish to move in the same direction. Governments and agencies engaged in supporting DPs need to show allegiance to national, regional and international faculties and instruments engaged in mitigating climate change/variability.

The following are some helpful recommendations:

Some suggest that "environmental impacts of DPs are minimal at global scale" just based on a partial analysis of environmental burdens observed only at camp level. However, the impacts should be viewed based on a life cycle assessment that incorporates the whole end-to-end process: the process of displacement at the place of origin, the journey to a displacement camp, the camp life itself, and the repatriation and reintegration processes.

A genuine care for the environment calls for a systems approach where: environmental impacts of humanitarian and development aid are considered an integral part of humanitarian response, disaster-risk reduction, Sustainable Development Goals (SDG), and climate nexus.

Host countries should incorporate issues of DPs in relevant environmental policies and maintain up-to-date environmental information, including zonings that delineate environmentally sensitive areas, protected areas with endangered animal and plant species, pasture and water resources. As most of the current DPs camps are already environmentally sensitive (arid & semi-arid areas), or are located near national parks and community forests, functional restoration protocols should guide camp establishments and resource utilization; and alternative settlement mechanisms encouraged and supported. In case of significant vegetation loss, DPs can engage in recovery projects funded by ***carbon markets;***

The environmental policy regime for NGOs and donor agencies needs revamping, and claims for grant compliance must be supported by action on the ground using "mandatory environmental assessments." In addition, global humanitarian professional associations and civil society organizations (CSO) should promote and recognise agencies with outstanding environmental care and financing.

Finally, the scope and mandate of the UNEP/OCHA Joint Environmental Unit (JEU) created to respond to environmental emergencies should be enlarged to include environmental damage that does not fall under the current definition, which in practice is reduced to oil

spills and the accidental release of hazardous substances.

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